Unit Outline

COMP3008 Distributed Computing

Semester 2, 2024

Unit study package code:	COMP3008
Mode of study:	Internal
Tuition pattern summary:	Note: For any specific variations to this tuition pattern and for precise information refer to the Learning Activities section. Lecture: 1 x 2 Hours Weekly Computer Laboratory: 1 x 2 Hours Weekly This unit does not have a fieldwork component.
Credit Value:	25.0
Pre-requisite units:	COMP2003 (v.0) Object Oriented Software Engineering or any previous version *AND* ISYS2014 (v.0) Database Systems or any previous version *OR* ISYS1001 (v.0) Database Systems or any previous version
Co-requisite units:	Nil
Anti-requisite units:	Nil
Result type:	Grade/Mark
Approved incidental fees:	Information about approved incidental fees can be obtained from our website. Visit https://www.curtin.edu.au/students/essentials/fees/understanding-your-fees/ for details.

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Learning Management System: Blackboard (lms.curtin.edu.au)

Acknowledgement of Country

We respectfully acknowledge the Indigenous Elders, custodians, their descendants and kin of this land past and present. The Centre for Aboriginal Studies aspires to contribute to positive social change for Indigenous Australians through higher education and research.

Coronavirus (COVID-19) Update

Curtin University is committed to supporting all our students and staff whether they are on campus, working remotely or overseas. Your health, safety and wellbeing are our priority and the continuing COVID-19 pandemic may require changes to the unit schedule, learning activities, delivery modes and assessment to provide flexible and safe options to our community. Curtin will endeavour to keep changes and disruptions to a minimum at all times. For current advice and further information visit https://www.curtin.edu.au/novel-coronavirus/.

Syllabus

This unit introduces students to Distributed Computing and its associated complexities. Topics covered include remote procedure calls and asynchronous calls, Multi-tiered architectures for distributed computing and XML serialisation and passing objects by value over the network. In addition the unit covers Serverside Web scripting with CGI based approaches. Further topics include Service orientated architectures, Web services as a SOA Framework and modern internet applications with Ajax and Web services.

Introduction

Distributed Computing takes a look at the techniques, systems, and difficulties of distributing computation over a network. We'll be looking at the history of DC, how to do RPC, how to serialize and send data over a network, Web services using a RESTful framework, and modern distributed system architectures in an increasingly distributed compute environment (including Blockchain).

The unit relies heavily on C# and Windows .NET MVC web services, so students are encouraged to familiarize themselves with Microsoft Windows and Visual Studio Community Edition.

Unit Learning Outcomes

All graduates of Curtin University achieve a set of six Graduate Capabilities during their course of study. These inform an employer that, through your studies, you have acquired discipline knowledge and a range of other skills and capabilities which employers would value in a professional setting. Each unit in your course addresses the Graduate Capabilities through a clearly identified set of learning outcomes. They form a vital part in the process referred to as assurance of learning. The learning outcomes notify you of what you are expected to know, understand or be able to do in order to be successful in this unit. Each assessment for this unit is carefully designed to test your knowledge of one or more of the unit learning outcomes. On successfully completing all of the assessments you will have achieved all of these learning outcomes.

Your course has been designed so that on graduating you will have achieved all of Curtin's Graduate Capabilities through the assurance of learning processes in each unit.

	On successful completion of this unit students can:	Graduate Capabilities addressed
1	Describe the attributes of components, the structure of a remote procedure call and the use of interfaces	
2	Design and construct a multi-tiered distributed system and reflect on the progress of learning new languages and paradigms	
3	Critically analyse design decisions and report outcomes in a format appropriate for a professional audience	
4	Justify the use of service orientated architectures for the internet	
5	Describe and consider the necessity of security in a distributed environment	

Curtin's Graduate Capabilities

	Apply discipline knowledge, principles and concepts		Innovative, creative and entrepreneurial		Effective communicators with digital competency
	Globally engaged and responsive		Culturally competent to engage respectfully with local First Peoples and other diverse cultures		Industry connected and career capable

Find out more about Curtin's Graduate Capabilities here: https://www.curtin.edu.au/about/learning-teaching/

Learning Activities

In DC, the course work is split into Theoretical and Practical concepts. Theoretical concepts are taught in the lectures, where the general ideas of distributed computing will be discussed in an open forum with students. Practical concepts are taught in the tutorials, which allow students to explore the problems and solutions available in the distributed computing space in an interactive manner with their tutor.

Tutorial sessions may not have the sufficient time to complete all practical content, so students are encouraged to attempt practicals prior to the tutorial time and come to the tutorial with questions for their tutor. This allows tutorials to be focused on the areas that students are least sure of.

Reading the lecture slides alone will not be sufficient to obtain a passing mark for the unit.

Learning Resources

Other resources

Official .Net developer sites and guidelines: https://docs.microsoft.com/en-us/dotnet/

Assessment

Assessment policy exemptions

- There are no exemptions to the assessment policy

Assessment schedule

	Task	Value %	Date Due	Unit Learning Outcome(s) Assessed	Late Assessments Accepted?*	Assessment Extensions Considered?*
1	Laboratory	20%	**Week:** TBD **Day:** TBD **Time:** TBD	1,2,4	Yes	Yes
2	Assignment 1 - NET Remoting and ASP NET Web API	40%	**Week:** 8 **Day:** 13th September, 2024 **Time:** 23:59	1,2,3	Yes	Yes
3	Assignment 2 - NET and Blockchain	40%	**Week:** 14 **Day:** 25th October, 2024 **Time:** 23:59	2,3,4,5	Yes	Yes

*Please refer to the Late Assessment and the Assessment Extension sections below for specific details and conditions.

Detailed information on assessment tasks

1. You must submit your answers to the practical worksheets, via Blackboard. Details of the deadlines, and the scope of the submission requirements, will be announced via Blackboard/email. You may be advised that, for a given worksheet, you only need to submit a subset of the work. However, unless so advised, you should submit answers for the whole worksheet.
   You will receive a mark for each worksheet, and these marks will add up to your overall practical work mark. There will face to face demo sessions.
   Note: The unit coordinator may require you to provide an oral justification of, or to answer questions about, any piece of written work submitted in this unit. Your response(s) may be referred to as evidence in an Academic Misconduct inquiry. In addition, your assignment submission may be analysed by Turnitin and/or other systems to detect plagiarism and/or collusion.
2. It is a programming assignment where the students will build a distributed Website using .NET Remoting and ASP.NET Web API's.
3. It is a programming assignment where the students will build a secured distributed application using .NET and blockchain.

Pass requirements

In order to pass, students must have achieved a mark of at least 50% overall

Assessment Moderation

Fair assessment through moderation

Moderation describes a quality assurance process to ensure that assessments are appropriate to the learning outcomes, and that students work is evaluated consistently by assessors. Minimum standards for the moderation of assessments are described in the Assessment and Student Progression Manual, available from https://www.curtin.edu.au/about/governance/compliance-legal/find-a-policy/

Pre-marking moderation

This unit complies with moderation of assessments as described in the Assessment and Student Progression Manual

Intra-marking / Post-marking moderation

This unit complies with moderation of assessments as described in the Assessment and Student Progression Manual

Late assessment

Where the submission of a late assessment is permitted, late penalties will be consistently applied in this unit.

Where a late assessment **is** permitted for an assessment item or the entirety of the unit (refer to the Assessment Schedule table in this Unit Outline) and the student does not have an approved assessment extension:

1. For assessment items submitted within the first 24 hours after the due date/time, students will be penalised by a deduction of 5% of the total marks allocated for the assessment task;
2. For each additional 24 hour period commenced an additional penalty of 10% of the total marks allocated for the assessment item will be deducted; and
3. Assessment items submitted more than 168 hours late (7 calendar days) will receive a mark of zero.

Where late assessment **is NOT** permitted for an assessment item or the entirety of the unit (refer to the Assessment Schedule table in this Unit Outline) and the student does not have an approved assessment extension:

1. All assessment items submitted after the due date/time will receive a mark of zero.

Assessment extension

Where an application for an assessment extension **is** permitted for an assessment item(s) within this unit (refer to the Assessment Schedule table in this Unit Outline):

1. A student who is unable to complete an assessment item by/on the due date/time as a result of exceptional circumstances beyond the student's control, may apply for an assessment extension on the Assessment Extension Application Form as prescribed by the Academic Registrar. The form is available on the Forms page at https://students.curtin.edu.au/essentials/forms-documents/forms/ and also within the student's OASIS (My Studies tab – Quick Forms) account.
2. The student will be expected to submit their application for an Assessment Extension with supporting documentation via the online form.
3. Timely submission of this information supports the assessment process. For applications that are declined, delayed submission may have significant ramifications on the possible marks awarded.
4. An application may be accepted up to five working days after the due date/time of the assessment item where the student is able to provide a verifiable explanation as to why they were not able to submit the application prior to the assessment due date/time

Where an application for an assessment extension **is NOT** permitted for an assessment item(s) within this unit (refer to the Assessment Schedule table in this Unit Outline):

1. All assessment items submitted after the due date/time will be subject to late penalties or receive a mark of zero depending on the unit permitting late assessment submissions.

Deferred assessments

If your results show that you have been granted a deferred assessment you should immediately check OASIS for details.

Deferred examinations/tests will be held from 09/12/2024 to 18/12/2024 . Notification to students will be made after the Board of Examiners' meeting via the Official Communications Channel (OCC) in OASIS.

Further assessment

Further assessments, if granted by the Board of Examiners, will be held between 09/12/2024 and 18/12/2024 . Notification to students will be made after the Board of Examiners meeting via the Official Communications Channel in OASIS.

It is the responsibility of the student to be available to complete the requirements of a further assessment. If your results show that you have been granted a further assessment you should immediately check OASIS for details.

Reasonable adjustments for students with disabilities/health circumstances likely to impact on studies

A Curtin Access Plan (CAP) is a document that outlines the type and level of support required by a student with a disability or health condition to have equitable access to their studies at Curtin. Carers for people with disability may also be eligible for support. This support can include alternative exam or test arrangements, study materials in accessible formats, access to Curtin's facilities and services or other support as discussed with an advisor from AccessAbility Services.

Documentation is required from your treating Health Professional to confirm your health circumstances or carer responsibilities.

If you think you may be eligible for a CAP, please contact AccessAbility Services. If you already have a CAP please provide it to the Unit Coordinator in week 1 of each study period.

Referencing style

The referencing style for this unit is IEEE Referencing Guide.

More information can be found on this style from the Library web site:
https://uniskills.library.curtin.edu.au/referencing/ieee/introduction.

Privacy

As part of a learning or assessment activity, or class participation, your image or voice may be recorded or transmitted by equipment and systems operated by Curtin University. Transmission may be to other venues on campus or to others both in Australia and overseas.

Your image or voice may also be recorded by students on personal equipment for individual or group study or assessment purposes. Such recordings may not be reproduced or uploaded to a publicly accessible web environment. If you wish to make such recordings for study purposes as a courtesy you should always seek the permission of those who are impacted by the recording.

Recording of classes or course materials may not be exchanged or distributed for commercial purposes, for compensation, or for any other purpose other than personal study for the enrolled students in the unit. Breach of this may subject a student to disciplinary action under Statute No 10 – Student Disciplinary Statute.

If you wish to discuss this please talk to your Unit Coordinator.

Copyright

Academic Integrity (including plagiarism and cheating)

Academic Integrity

Curtin's Student Charter, Academic Integrity Program (AIP), and core Values guide expectations regarding student behaviour and responsibilities. Information on these topics can be found on the Academic Integrity Website.

Academic Integrity Warnings

An Academic Integrity Warning may be issued to a student in limited circumstances and only where misconduct is not involved.

Academic Misconduct

Staff members are required to report poor academic practice and suspected misconduct. Academic Misconduct means conduct by a student that is dishonest or unfair in connection with any academic work. This includes all types of plagiarism, cheating, collusion, falsification or fabrication of content, and behaviours like falsifying medical certificates for extension. Contract cheating, the use of file sharing, translation services/apps, paraphrasing tools (text-spinners), article generators, and assignment help websites also may be considered academic misconduct.

Check your assessment instructions carefully before using any generative artificial intelligence (Gen-AI) software (e.g. Chat GPT, Midjourney, GitHub Copilot, etc.). You are not permitted to use Gen-AI software in any assessment task unless written permission is explicitly granted by the Unit Coordinator (e.g. within Blackboard or the assignment specifications). If the use of Gen-AI software has been approved, you must document its use, apply appropriate acknowledgement and attribution rules, and include a statement as to the nature and extent of the use when submitting the assessment. Unapproved, inappropriate, or undisclosed use may be dishonest or unfair behaviour, and thus considered misconduct. For further information on the use of Gen-AI software see the Academic Integrity Website.

The longer term personal, social, and financial consequences of misconduct can be severe, so please ask your tutors or unit coordinator if you need clarification or are unsure what to do. If your work is the subject of an inquiry, you will be given an opportunity to respond and appropriate support will be provided. Academic work under inquiry will not be graded until the process has concluded. Penalties for misconduct may include a warning, a reduced or nil grade, a requirement to repeat the assessment, an annulled grade (ANN) or termination from the course. For more information refer to Statute No.10 Student Discipline and Academic Misconduct Rules.

Information and Communications Technology (ICT) Expectations

Curtin students are expected to have reliable internet access in order to connect to OASIS email and learning systems such as Blackboard and Library Services.

You may also require a computer or mobile device for preparing and submitting your work.

For general ICT assistance, in the first instance please contact OASIS Student Support: oasisapps.curtin.edu.au/help/general/support.cfm

For specific assistance with any of the items listed below, please visit UniSkills and the IT tools and guides webpage.

- Using Blackboard, the I Drive and Back-Up files
- Introduction to PowerPoint, Word and Excel

Additional information

This unit, in line with current research and university values, strives to achieve a positive and inclusive educational environment. This supports improved academic performance, increased confidence and creates a greater sense of safety and belonging. Your teaching team is committed to providing a safe and inclusive learning experience and requires students to take reasonable and appropriate measures to actively eliminate discrimination on the basis of ability; cultural and social background; and diverse sex, sexuality, and gender.

Link to Equity and Inclusivity web resources:
https://about.curtin.edu.au/values-vision-strategy/diversity-equity/

Enrolment

It is your responsibility to ensure that your enrolment is correct - you can check your enrolment through the eStudent option on OASIS, where you can also print an Enrolment Advice.

Student Rights and Responsibilities

It is the responsibility of every student to be aware of all relevant legislation, policies and procedures relating to their rights and responsibilities as a student. These include:

- the Student Charter
- Values and Signature Behaviours
- the University's policy and statements on plagiarism and academic integrity
- copyright principles and responsibilities
- the University's policies on appropriate use of software and computer facilities

Information on all of the above is available through the University's "Student Rights and Responsibilities" website at: students.curtin.edu.au/rights.

Note: In Australia and other jurisdictions, students are required to complete a screening check prior to undertaking any activities that include children (e.g. surveying children at a school as part of a project). If this applies to you, start by contacting your unit coordinator for advice.

Student Equity

There are a number of factors that might disadvantage some students from participating in their studies or assessments to the best of their ability, under standard conditions. These factors may include a disability or medical condition (e.g. mental illness, chronic illness, physical or sensory disability, learning disability), significant caring responsibilities, pregnancy, religious practices, living in a remote location,or another reason. If you believe you may be unfairly disadvantaged on these or other grounds please contact the appropriate service below. It is important to note that the staff of the University may not be able to meet your needs if they are not informed of your individual circumstances, so please get in touch with the appropriate service if you require assistance.

To discuss your needs in relation to:

- Disability or medical conditions, contact AccessAbility Services: https://students.curtin.edu.au/personal-support/disability/
- Elite athletes, contact Elite Athlete Coordinator: https://stadium.curtin.edu.au/sport/academy/elite-athlete-program/
- All other grounds, contact the Student Wellbeing Advisory Service: https://students.curtin.edu.au/personal-support/counselling-guidance/wellbeing/

Recent Unit Changes & Response to Student Feedback

Students are encouraged to provide feedback through student surveys (such as Insight (Curtin's new unit and teaching survey developed in collaboration with students and staff) and the annual Student Experience Survey) and interactions with teaching staff.

Listed below are some recent changes to the unit as a result of student feedback.

DC has been rewritten this semester to better cover modern distribution techniques. This includes:

1. A restructure of material.
2. Sample codes are being provided.
3. Some workshops are now extended to multiple weeks for students to have fewer time constraints.
4. Addition of RESTful web services via .NET MVC as the primary distribution framework
5. The addition of modern distributed computing concerns, such as an introduction to blockchain and distributed learning.

Program calendar

Program Calendar – Semester 2 2024

Week	Begin Date	Lecture/ Seminar	Practical	Assessment
0	15 July	Orientation Week		
1.	22 July	Introduction to Distributed Computing		
2.	29 July	RPC, RMI, and .NET Remoting	1. Introduction to Visual Studio and .Net	Assignment 1 (PART A + PART B) Release
3.	5 August	Multi-tier Architecture	2. Writing simple DLL and .NET remoting server	
4.	12 August	Asynchronous Communication	3. Writing a simple WPF Windows APP for remoting	Assignment 2 (PART A + PART B) Release
5.	19 August	Web Service	4. Working with multi-tier architecture	
6.	26 August	Web Service with database	5. Working with Asynchronous calls	
7.	2 September	Tuition Free Week		Tutorial 1,2,3,4,5 Due
8.	9 September	JavaScript and MVC Website	5. Building Webservice - Part 1, Tutorial 1,2,3,4,5 marking	Assignment 1 Due
9.	16 September	Distributed Computing Security Issue	Assignment 1 Demo marking	
10.	23 September	Modern Distributed Computing	7. Building Webservice - Part 2	
11.	30 September	Blockchain	8. Working with Web API and Local DB	
12.	7 October	Blockchain Part 2	9. Creating ASP.NET CORE Web application	Tutorial 6, 7, 8, 9 Due
13.	14 October	Distributed Collaborative Learning	Tutorial 6, 7, 8, 9 demo marking	Assignment 2 (Part A) Due
14.	21 October	Study Week	Assignment 2 (Part A) Demo Marking	Assignment 2 (Part B) Due
15.	28 October	Examinations		
16.	4 November	Examinations		